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The Role of Health Administration, Social Services, Health Informatics, and Public Health in Driving Digital Transformation in Healthcare Systems: An Integrative Review

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Abstract

Introduction: Machine learning, Artificial intelligence and mobile medical software and apps that help physicians' everyday clinical choices are just a few examples of how digital technologies have been revolutionizing healthcare. Tools for digital health have great possibilities for enhancing the performance of personal healthcare in addition to our ability to identify and treat illnesses. Aim of work: for exploring the vital role that public health, social services, health administration, and health informatics play in promoting digital transformation in healthcare systems. Methods: We used the following search phrases to perform an extensive search in the MEDLINE database: role, digital transformation, public health, enhancing, health informatics, and health administration. We conducted a Google Scholar search to discover and look over scholarly reviews related to my review. Certain criteria for inclusion had an impact on the choosing of articles. Results: With distinct headers in the discussion part, the study was divided into several sections. Conclusion: The complete integration of data analytics, digital technologies and creative procedures to improve the quality of healthcare services is known as "digital transformation" in the healthcare section. For the treatment of non-communicable diseases, digital services can be both economical and effective; yet, their generalizability is constrained by the variable treatment effects. To collect, analyze, and apply data to improve health outcomes, health informatics integrates data science, data analytics and information management. To increase the effectiveness of healthcare organizations, technologists create and evaluate data collecting and usage platforms. The usage of advanced analytics technologies and the ongoing geometric development in the quantity of data that can be analyzed will affect almost every side of healthcare, including the management procedures automation, the quality of insurance rates, and the usage of AI in diagnosis. Some important aspects of digital healthcare transformation include Electronic health records, Data analytics, Artificial intelligence, Telemedicine and Wearable devices. Patients can utilize patient portals to access personal health information such as appointment data, medication information and test results. The digital services effects are on the health of population, expenses, and healthcare professional and patient satisfaction, as well as to pinpoint factors that promote and hinder the use of digital services in social welfare and healthcare. Growing in popularity, health information

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technology enables healthcare medical facilities to use pertinent data to scale forecast and operations treatment outcomes through information systems communication. Automation in the medical field can considerably boost efficiency in numerous healthcare administration jobs like: Streamlining appointment scheduling, maintaining compliance with healthcare regulations and laws, Managing work schedules for caregivers and other staff members and Keeping patient health information.

Keywords: *Role, digital transformation, public health, Enhancing, health Informatics, Health Administration.*

Introduction

Digital technology has been driving a revolution in health care, from artificial intelligence and machine learning to mobile medical apps and software that assist the clinical decisions doctors make on a daily basis. Digital health tools have great potential to enhance the delivery of individual healthcare as well as our ability to identify and treat sickness. (Akhtar et al., 2022).

Digital tools give healthcare practitioners a complete picture of patient health by significantly increasing access to health and other data. They can use this information to develop patient-specific therapies, lower medical costs, and avoid disease. Additionally, thanks to contemporary technologies, people are becoming more conscious of their own health. As a result, doctors are more productive and patients obtain better medical treatment. (Ranabhat &Acharya, 2023).

The web and the internet have recently created new options to lower costs and improve response times for health care services. It is clear that a new age is emerging, one that will significantly change the provision of services of healthcare. This will assist us win the public's trust in our ability to deliver excellent medical care. (Reddy et al. 2023.

Health informatics contributes significantly to achieving interoperability by establishing common protocols and standardized data formats. Lastly, these IT technologies help physicians make better decisions by providing timely, evidence-based information. Health informatics' main goal is to employ actual medical data to enhance our knowledge of medical practice and medicine. Health informatics is a combination of computer science and information science in the field of healthcare. (Pamg et al., 2018).

The field of public health plays an important role in the digital revolution of health. Applications of digitalization in public health services improve health services' effectiveness and efficiency while also making them easier to access (Wang et al., 2018).

AIM OF WORK

The aim of this review is Discussing about how Health Administration, Social Services, Health Informatics, and Public Health's Contribution to Healthcare Systems' Digital Transformation. It aims to focus on public health role, digital public health, digital technologies and Health Informatics in Driving Digital Transformation. Additionally, the review is intended to pinpoint Digital Transformation in healthcare and provide some insight into the modifications taking place in the scope of Digital technology is rapidly expanding and being used in many health fields.

METHODS

A thorough review was performed by scientific platforms as Google Scholar and Pubmed, using specific keywords like Role, digital transformation, public health, Enhancing, health Informatics, Health Administration. Gathering all relevant research papers was the aim. Certain criteria were used to choose the articles. We removed case reports, publications lacking complete material and duplicate articles after thoroughly examining the abstracts and noteworthy titles of every publication.

RESULTS

The current study focused on the vital role that public health, social services, health

administration, and health informatics play in promoting digital transformation in healthcare systems. The research was consequently published under numerous headings in the debate area, such as Health Informatics and Public Health in Driving Digital Transformation in Healthcare Systems and Health Informatics' role in Driving Digital Healthcare Systems Transformation.

Discussion

Digital technologies (DTs) have been a major part of healthcare organizations after the expression "e-health" was first introduced in the 1990s. The concept that applying these technologies' potential helps organizations, patients, and medical staff in terms of greater efficacy and efficiency forms the basis of digitalization in the healthcare industry (Amir et al., 2024).

In the healthcare sector, where managers and professionals have access to a variety of information, such as electronic patient records, staff records, clinical data, diagnostics, drug prescriptions, medical imaging techniques, and mobile health, this is especially crucial. Therefore, the adoption of new DTs may facilitate the gathering, handling, processing, and analysis of this data to boost comprehension and enhance decision-making (Marques and Ferreira, 2020).

Almost every facet of healthcare system, including the administration processes, the use of AI in diagnosis and the precision of insurance rates will be impacted by the deployment of advanced techniques of analysis and the continuous geometric expansion in the quantity of data that can be analyzed. Patients can access individual health information, as test results, appointment data, and prescription details, through patient portals (Akhtar et al., 2022).

The role of Health Administration and Social Services in Driving Digital Transformation in Healthcare Systems

Digital technology is currently utilized in health care in a variety of ways, including the maintenance of electronic medical records, diagnostics, the issuance and administration of medication, the design of artificial organs, robotic surgery, and virtual reality (telehealth), all of which enhance patient safety (Adler and Rehkopf, 2008)

In order to give patients, the best care possible, digital health can save and retrieve data from any location in a matter of minutes and share it with other specializations. (Andersen RM. 1995).

With the usage of digital technologies, medical professionals can contact with patients by text messaging, smartphones, emails, and test results without physically visiting the hospital. Using new technology, medical professionals can create their own webinars, movies, and use social media and online platforms to interact with other professionals and offer consumers effective and efficient care (Jamoom et al., 2011).

This assists the provider to provide services even in isolated areas where access to specialized care is limited. For radiological investigations can be delivered to far-off areas so that specialists can make decisions. More people can participate in training and educational programs at a lower cost and with greater efficiency thanks to telecommunication. Many health apps have been developed caused by the digital revolution. It is sometimes used to monitor the health of the patient. Regular health education is available to patients. Patients don't need to visit labs to get their test results due to these apps.

The role of Health Informatics in Driving Healthcare Systems Digital Transformation

Health information technology is a field that utilizes data analytics and technology to improve health outcomes and speed up procedures. This means making intelligent usage of information's technology to improve the efficiency of health care delivery. Apart from bolstering clinical assessments, the field of health informatics is utilized to improve patient involvement and

maximize operational efficiency in healthcare environments. (Abbott LS, Elliott LT. 2017)
Health information technology is a field that blends information technology, analytics modeling, and healthcare procedures to enhance patient care, medical decision-making, and the function of the health care system. To enhance data management and improve clinical operations, modern healthcare uses EHRs, FHIR, AI-driven solutions, predictive analytics, and digital technologies. Innovation in medicine and improvements in patient care result from this strategy. (Jordan MI, Mitchell TM. (2015)).
Due to the abundance of unstructured information, health information technology is becoming more and more common. This is due to health care facilities may utilize information systems interaction to expand operations and estimate future outcomes of treatment for doctors and decision-doctors. Huge amounts of information are being collected and analyzed globally to develop patient treatment and diagnosis, enhance systems of public health, support government agencies in creating and executing policies of public health, and improve confidence in future generations who wish to utilize improved public health systems (Aziz et al., 2017).
EHRs (Electronic Health Records): HIE facilitates interchange and access of health data across clinics, hospitals, and specialists without risking the data's security.
FHIR: The fundamental concept under FHIR was to develop collection of reviews to gain an access and use them. FHIR manipulates health data of the patient at the granular level utilizing aspects known as resources. This character distinguishes FHIR from all other standards. The main aim of FHIR is to retain information accuracy while lowering implementation complexity. (Jordan MI, Mitchell TM (2015).
CDSS (Clinical Decision Support Systems): The system utilizes AI and machine learning to help with health risk assessment, therapy choosing, and disease diagnosis. (Jamoom et al., 2011).
Patient Monitoring and Telemedicine: Wearable technology enables doctors to remotely monitor patients' chronic illnesses and conduct remote consultations (Röcker et al., 2014).
Business Intelligence and Healthcare Analytics to identify and predict patterns in outbreaks of diseases and distribute hospital resources as effectively as possible, a variety of data analysis techniques are available (Abiola et al., 2024).
The importance of Health informatics
Optimizing Safety and Patient Care: Recognizing "what is health informatics" makes it clearer to understand how it affects modern healthcare, from effective data management to real-time patient monitoring. Decreases medical errors and misdiagnoses. Encourages individualized plans for therapy (Yang Gong, 2016).
Improving Operational Effectiveness: Health information technology provides automated administrative duties like appointment scheduling and billing. The technology minimizes administrative work and strengthens database administration abilities.
Assisting Public Health Initiatives: assists with disease surveillance and outbreak management. Supports immunization programs with data analysis (Battineni et al., 2020).
Supporting Medical Research: This system provides researchers with access to comprehensive medical records for the purpose of carrying out clinical research. By analyzing data based on artificial intelligence, the application of AI gives developers the tools they need to create ground-breaking medications. (Rajpurkar et al., 2022).
The role of Public Health in Driving Healthcare Systems Digital Transformation
Since the beginnings of the Internet, public health has been adjusting to the digital change of society. The proliferation of digital technology linked to pandemics in recent years. Digital public health is the usage of technologies in the field of public health by means of health equality,

intervention planning, and disease surveillance. Clinicians can gather large amounts of data for research, clinical trials, and epidemiological studies in a matter of minutes thanks to digital health. Therefore, health practitioners can use this data to more effectively implement preventive actions. (Yasnoff et al., 2000).

The technical procedure for transforming analog records into digital data was known as digitization in the context of public health; the combination of public health operations into digital technologies was referred to as digitalization; and a widespread cultural change that combines digital methods and reorganizes services according to the public health needs was referred to as digital transformation. Digital transformation has made it easier for people to conduct transactions and obtain public services via electronic platforms. Faster and more efficient service delivery in a variety of areas, including health, education, and security, increases citizen happiness. The level of quality of public services is improved by increased satisfaction as well as the accountability and openness that digitalization brings. Transactions and decision-making procedures become more verifiable and documented as a result of digitization (Berkman et al., 2011).

For health services to be delivered effectively, gathering field-related data is crucial.

Through the nationwide service network in the country, information about health services can be gathered (Patel et al., 2012).

Information and communication technologies, intelligent and networked robotics, monitoring systems and networked support are the three primary domains in which digital technologies are applied in the public health sector. The public's perception of digital health in these domains makes it feasible to enhance health and well-being by promoting the creation and uptake of accessible, affordable, quantifiable, long-lasting, and human-focused digital health approaches to prevent, identify, and address illnesses and epidemics. (Foley et al., 2021).

Public health guarantees quick, responsive, and easy access to health-related services and information that are focused on their needs. Alongside these shifting expectations, new methods of public health surveillance are being developed, and new and varied large datasets are becoming more accessible both inside and outside of public health organizations (Amir et al., 2024).

Accessibility is the capacity of all people to obtain health care from any location. In order to improve society's total health value, it is imperative that public health implement digital health efforts to increase accessibility to health services. As in any other discipline, a public administration is deemed successful if it offers and enhances accessibility in the health sector. (Foley et al., 2021).

Conclusion

The complete integration of data analytics, digital technologies and creative procedures to enhance the delivery of medical services is known as "digital transformation" in the healthcare industry.

Non-communicable diseases can be effectively and economically treated with digital services; the effects of digital technologies are on health of population, expenses, and healthcare professionals and patient, as well as to pinpoint the advantages and disadvantages of utilizing digital technologies in social welfare and healthcare.

Data analytics, data science, and information management are all combined in health informatics to collect, analyze, and apply data to improve health outcomes. To increase efficiency in healthcare organizations, information technologists create and evaluate data collecting and usage systems. Some important components of healthcare digital transformation include health

Electronic records, Data analytics, Telemedicine, Artificial intelligence and Wearable devices. Electronic health records helps clinicians to construct individualized treatments according to individual patient information like medical records and genetic profiles. By utilizing this data, healthcare providers can personalize treatment regimens, identify future health hazards, and prescribe remedies that are properly matched to each patient's individual needs. Healthcare facilities may utilize Communication between information systems to scale activities and forecast treatment results by giving decision-makers and doctors relevant data thanks to the growing of health information technology.

Wearables, social media, artificial intelligence, big data, and mobile apps are just a few of the digital technologies that have been employed with the ability to improve the speed, efficacy, and affordability of public health care services.
Nearly every facet of healthcare will be impacted by the usage of analytics techniques and the continuous geometric expansion in the quantity of information that can be analyzed, including the management processes automation, the precision of insurance's rates, and the use of AI in diagnoses. Patient portals allow patients to access individual health information, including appointment schedules, test results and medication information.

The building of strategic frameworks by global and regional public health organizations to leverage the potential advantages of digital technology to enhance The developing importance of digital technologies in public health is illustrated by public health outcomes. Automation in the medical field can considerably boost efficiency in numerous healthcare administration jobs like: Streamlining appointment scheduling, Maintaining compliance with healthcare regulations and laws, Managing work schedules for caregivers and other staff members and Keeping patient health information.

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